

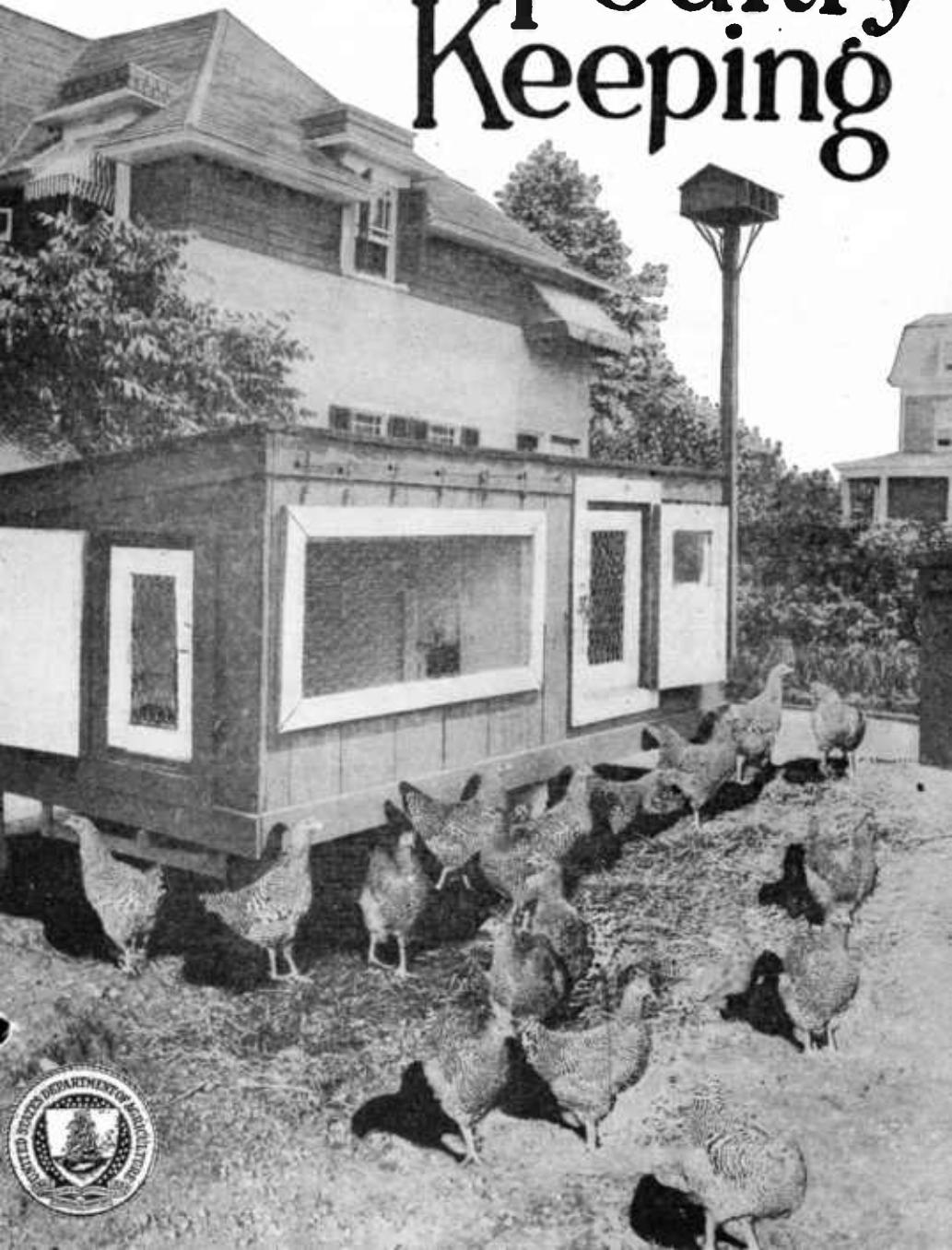
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UNITED STATES DEPARTMENT OF AGRICULTURE

# Back-yard Poultry Keeping



**I**N every household, no matter how economical the housewife, there is a certain amount of table scraps and kitchen waste which has feeding value but which, if not fed, finds its way into the garbage pail.

Poultry is the only class of domestic animals which is suitable for converting this waste material, right where it is produced in the city, into wholesome and nutritious food in the form of eggs and poultry meat.

Each hen in her pullet year should produce 10 dozen eggs. The average size of the back-yard flock should be at least 10 hens. Thus, each flock would produce in a year 100 dozens of eggs which, at the conservative value of 35 cents a dozen, would be worth \$35.

By keeping a back-yard poultry flock the family would not only help in reducing the cost of living but would have eggs of a quality and freshness which are often difficult to obtain.

Remember that eggs produced by the back-yard flock cost very little, as the fowls are fed largely upon waste materials.

Contribution from the Bureau of Animal Industry

JOHN R. MOHLER, Chief

Washington, D. C.

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# BACK-YARD POULTRY KEEPING.

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## ADVANTAGES OF HOME POULTRY.

THE keeping of a small flock of laying hens on a town or village lot or in a city back yard is an important branch of poultry keeping. Though the value of the product from each flock is small of itself the aggregate is large. The eggs and fowls from such a



FIG. 1.—Poultry house and run in a back yard.

flock may be produced at a relatively low cost, because of the possibility of utilizing table scraps and kitchen waste which otherwise would be thrown away. A small flock of hens, even as few as six or eight, should produce eggs enough, where used economically, for a family of four or five persons throughout the year, except during

the molting period of the fall and early winter. By the preservation of surplus eggs laid during the spring and early summer this period of scarcity can be provided for. The keeping of pullets instead of hens also will insure the production of eggs at that time. Not only will the eggs from the home flock materially reduce the cost of living but the superior freshness and quality of the eggs are in themselves well worth the effort expended. Eggs are a highly nutritious food and are so widely used as to be almost indispensable, and an occasional chicken dinner is relished by everyone.

Where conditions render it feasible and cheap, small flocks of poultry should be kept to a greater extent than at present by families in villages and towns, and especially in the suburbs of large cities. The need for this extension of poultry raising is particularly great in those sections where the consumption of poultry products exceeds the production, with the result that prices are high.

### **OVERCOMING OBJECTIONS TO KEEPING POULTRY IN THE CITY.**

Objection is frequently raised to the keeping of poultry in towns and cities because of the odor which may result and also because of the noise which is made by roosters crowing, particularly in the early morning. In some cases city regulations have been formulated to prevent or to control poultry keeping. Where there are city regulations it is necessary to find out their provisions and to conform to them. There is no necessity for the poultry flock to become a nuisance to neighbors. If the dropping boards are cleaned daily and the houses and yards are kept in a reasonably clean condition there will be no annoying odors.

The male bird need not be a nuisance. Unless it is intended to hatch chickens from the flock it is unnecessary to keep a male bird. The fact that there is no male in the flock will have absolutely no effect on the number of eggs laid by the hens. If it is desired to mate the hens and to hatch chicks the male bird should be disposed of just as soon as the hatching season is over. This is desirable not only to eliminate noise, but also to save the feed that the male would eat and to produce infertile eggs, which keep much better than fertile eggs and consequently are superior for preserving or for market.

The flock must be kept confined; otherwise the hens will stray into neighbors' yards and gardens, where they may cause damage and are almost sure to cause ill feeling.

### **KIND OF FOWLS TO KEEP.**

Householders usually desire not only eggs for the table and for cooking, but also an occasional chicken to eat. For this reason one of the general-purpose breeds, such as the Plymouth Rock, Wyandotte,

Rhode Island Red, or Orpington, is preferable to the smaller egg breeds, such as the Leghorn. Not only do the mature fowls of those breeds, because of their larger size, make better table fowls than the Leghorns, but the young chickens for the same reason make better friers and roasters, whereas chickens of the egg breeds are only suitable for the smaller broilers. The general-purpose breeds are also "broody" breeds, the hens making good sitters and mothers, which is a decided advantage when chickens are to be hatched and raised. The hens of the egg breeds seldom "go broody" and are in any event rather unreliable sitters and mothers. If, however, the production of eggs outweighs the desire for an occasional table fowl, the lighter egg breeds undoubtedly will be found better, because they lay as many eggs and do so on less feed, with the result that they produce the eggs more cheaply. It is by all means advisable to keep some pure breed or variety. Where this is done, sales at a profitable figure can often be made of breeding stock or of eggs for hatching.

### **SIZE OF FLOCK.**

The size of the flock which can be most efficiently kept will depend first of all upon the space available and, secondly, upon the amount of table scraps or other waste which is available for feed. It is a mistake to overstock the available space. Better results will be obtained from a few hens in a small yard than from a larger number. The back-yard poultry flock rarely will consist of over 20 or 25 hens and in many cases of not more than 8 or 10, or occasionally of only 3 or 4. For a flock of 20 to 25 hens a space of not less than 25 by 30 feet should be available for a yard. Where less space is available, the size of the flock should be reduced, allowing on the average 20 to 30 square feet per bird. A few hens are sometimes kept successfully with a smaller yard allowance than this, but if the space is available a yard of the size indicated should be used.

### **PROCURING STOCK.**

The best way for the city poultry keeper to procure stock is to purchase it in the fall. An effort should be made to obtain pullets rather than older hens, and the pullets selected should be well matured, so that they will begin to lay before the cold weather sets in. Evidences of the maturity of pullets are the development and red color of the comb and a size and growth which are good for the breed or variety. Yearling or older hens will lay few or no eggs during the fall and early winter, while they are molting. Well-matured pullets, however, should lay fairly well during this period, so that an immediate return is realized from the investment. The purchasing of pullets in the fall is preferable in most cases to purchasing day-old

chicks or to hatching chicks in the spring. Usually little space is available for the raising of chicks, and, moreover, many city dwellers have had no experience in raising them. Under these conditions the results are likely to be very poor. Hatching and rearing chicks also necessitates broody hens, or else investing money in incubators and brooders. Such an investment is often too great to prove profitable with the average small flock. If chicks are raised, they must be fed throughout the summer and no return will be obtained until the pullets begin to lay in the fall, except that the males can be eaten or sold.

When pullets are to be purchased, it is well, if possible, to go to some farmer or poultryman who may be known to the prospective



FIG. 2.—A back-yard poultry plant. In the background are the poultry houses set up off the ground on account of rats. At the left is a shade made of wooden strips and roofing paper. At the right are the coops for the hens and chicks. In the foreground oats for green feed are being sprouted under wire screens.

purchaser. In some cases it may pay to make arrangements with the farmer to raise the desired number of pullets at an agreed price. Where the householder does not have an opportunity to go into the country for his pullets, he can often pick them out among the live poultry shipped into the city to be marketed. The advice of some one who knows poultry should be sought in making such a purchase, to make sure that pullets or young hens are obtained, and that the stock is healthy. Often the local poultry associations are glad to help the prospective poultry keeper to get stock by putting him in communication with some of its members having stock for sale. Sometimes the local board of trade or chamber of commerce is glad to bring together the prospective purchaser and the poultry raiser.

## HOUSING.

The flock should be comfortably but not expensively housed. A house which provides a floor space of 3 or 4 square feet per bird is ample for the purpose, and fowls are often successfully kept with an allowance no greater than  $2\frac{1}{2}$  to 3 square feet. Houses must be dry and free from draft, but must allow ventilation. Often there is an unused shed or small building on the place which can easily be converted into a chicken house. (See fig. 3.) The front of the poultry house should face toward the south, if possible, so that the sun will shine into it. Where there is a board fence it is sometimes possible to take advantage of this by building the poultry house in the

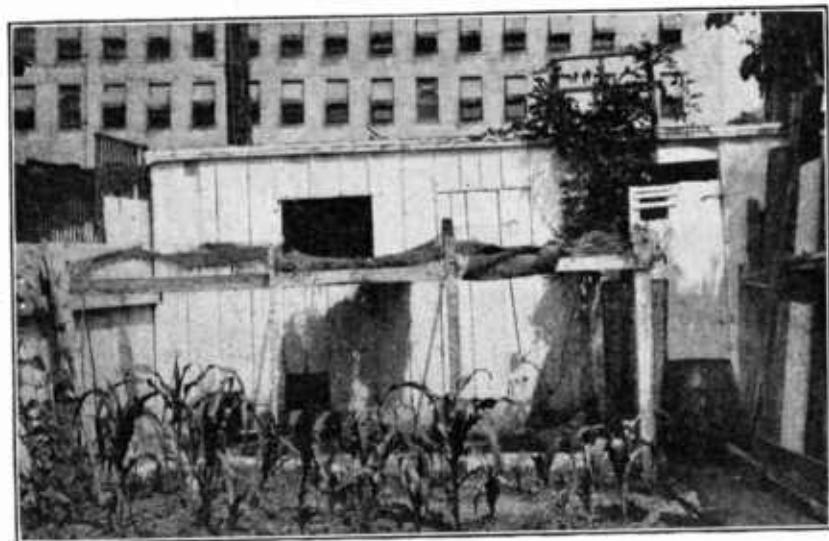


FIG. 3.—A shed in the heart of the city, utilized for a poultry house. While a larger opening in the front would admit more light and make a more suitable hen house, the fowls kept here have done very well. The wire netting used for the yard was purchased very cheaply at an auction. The grass and sacks shown on the top of the run are used to furnish shade.

corner of the fence, and making the fence itself, with the cracks covered by strips or battened, serve as the back and one side of the house. (See fig. 4.) Perfectly satisfactory houses can be made cheaply from piano boxes or other packing cases. Two piano boxes with backs removed can be nailed together and a door cut in the end. These boxes should be covered with roofing paper in order to keep the house dry and to make it wind-proof. A portion of the door should be left open or covered with a piece of muslin, so as to allow ventilation. (See figs. 5 and 6.) Similar houses can be constructed of packing cases at a relatively small cost. A small amount

of 2 by 4 or 2 by 3 lumber can be purchased for framing. The box boards can be applied for siding or sheathing and then covered with roofing paper.

A cheap house 8 by 8 feet square can be made of 2 by 4's and 12-inch boards. Plans for such a house are given in figure 7. The 2 by 4's are used for sills, plates, corner posts, and 3 rafters. No studding is required except that necessary to frame the door and window space. The boards are run up and down and add sufficient stiffness to the house. They are used also for the roof and covered with roofing paper. The back and sides of the house also can be

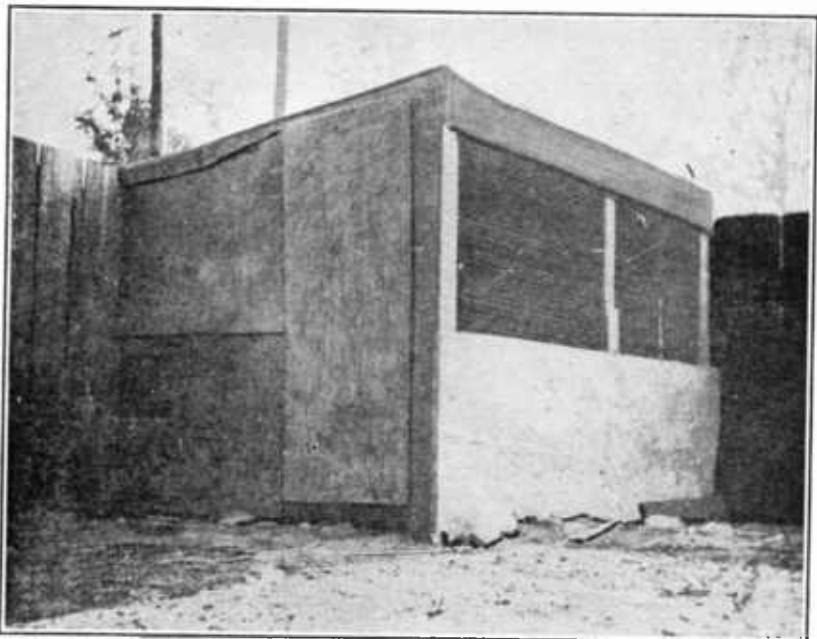


FIG. 4.—Poultry house built in the corner of a board fence, utilizing the fence for the back and one side of the house.

covered with roofing paper, or the cracks can be covered with wooden battens or strips  $1\frac{1}{2}$  to 3 inches wide. In the front of the house should be left a window or opening that can be closed, when desired, by a muslin screen or curtain, which serves as a protection against bad weather but allows ventilation. In the side a door should be provided which will allow entrance. A shed or single-slope roof is most practical because easiest to build. A height of 6 feet in front and 4 feet in the rear is ample. If desired, the house may be built higher, so that it is more convenient to work in; the increase in cost will be slight. The ventilator in the rear is not needed in the northern part of the country, but is desirable in the South.

Such a house is large enough for a flock of 20 hens. It can be built quickly and easily and is cheap in construction. The material required is as follows:

**BILL OF MATERIAL.**

**Framing.**

Roof rafters and end plates, 5 pieces, 2 by 4 inches by 8 feet long.

Roof plates, 2 pieces, 2 by 4 inches by 8 feet long.

Sills, 4 pieces, 2 by 4 inches by 8 feet long.

Posts, 3 pieces, 2 by 4 inches by 6 feet long; 2 pieces 2 by 4 inches by 4 feet long.

Stringer, 1 piece, 2 by 4 inches by 8 feet long.



FIG. 5.—Poultry houses, each of which is made out of two piano boxes. The two boxes are placed back to back, 3 feet apart, the back and top of each removed, a frame for roof and floor added, and the part between the two boxes built in with the boards removed from the boxes. The whole is covered with roofing paper. With piano boxes at \$2.50 each, such a house can be easily and quickly constructed for \$12. It will accommodate 12 hens comfortably.

Total pieces required to cut list:

7 pieces 2 by 4 inches by 16 feet long.

1 piece 2 by 4 inches by 12 feet long.

Total feet in board measure, 83.

**Roosts and Dropping Board.**

1 piece 2 by 3 inches by 16 feet long.

1 piece 2 by 3 inches by 10 feet long.

Total board measure, 13 feet.

2 pieces 1 by 12 inches by 16 feet long.

Total board measure, 32 feet.

## Sheathing Boards.

Roof, 5 pleees 1 by 12 inches by 16 feet long.

Two sides, 2 pieces 1 by 12 inches by 10 feet long; 3 pleees 1 by 12 inches by 12 feet long; 2 pieces 1 by 12 inches by 14 feet long.

Front, 2 pleees 1 by 12 inches by 10 feet long.

Back, 2 pieces 1 by 12 inches by 16 feet long.

Total feet in board measure, 216.

## Batten Strips.

130 linear feet  $\frac{1}{2}$  by 2 inch strips, 24 board feet.

24 linear feet  $\frac{1}{2}$  by 2 inch strips, for curtain frame, 4 board feet.

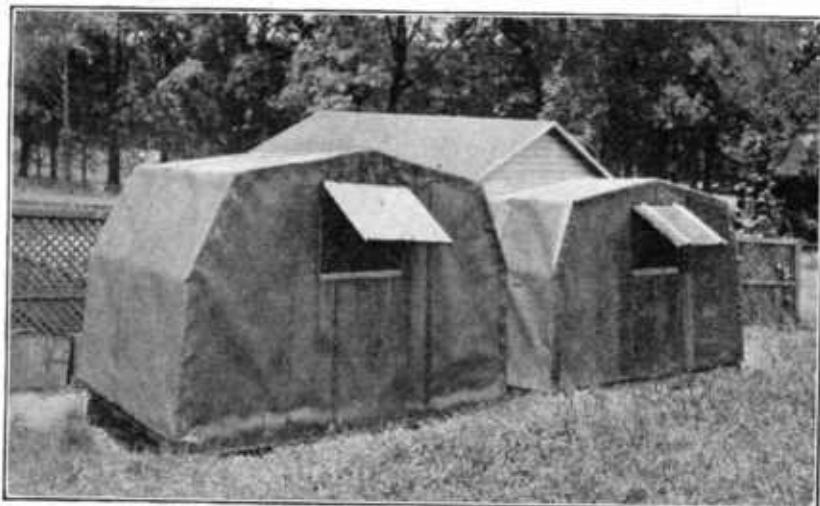


FIG. 6.—Rear view of piano-box houses shown in figure 5. The openings at the rear are provided for ventilation and coolness in hot weather. Windows could be used instead of solid shutters and would make the houses lighter when closed.

## Roofing.

80 square feet roofing paper; nails and tins.

## Hardware and Sundries.

1 pair 8-inch T hinges for door.

1 padlock and latch for door.

3 pairs 4-inch T hinges for curtain frame and rear ventilator.

5 pounds 10-penny wire nails for framing.

10 pounds 8-penny wire nails for sheathing.

5 pounds 4-penny wire nails for strippling.

21 square feet poultry wire,  $\frac{1}{2}$ -inch mesh, for front.

3 yards muslin for curtain.

32 rough bricks to build piers.

## Floor.

If floor is desired in house, add the following material:

2 pieces 2 by 4 inches by 16 feet long.

4 pieces 1 by 12 inches by 16 feet long.

Total feet in board measure, 85.

## Total Lumber Required.

Without floor, 372 board feet.

With floor, 457 board feet.

Lumber may be rough or dressed.

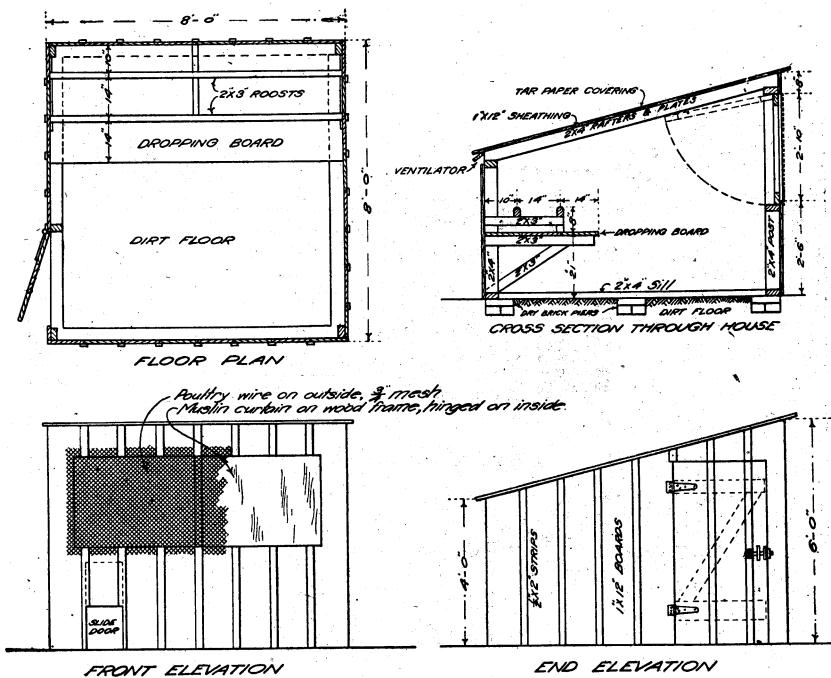


FIG. 7.—Plan of a simple back-yard poultry house.

**Floor.**—If the soil is well drained and remains dry no floor need be used in the house. Often a slight dampness can be corrected by filling up the floor several inches above the outside ground with sand, cinders, gravel, or dry dirt. Three or four inches of the surface of the floor, and of the run if a very small run is used, should be removed and replaced with fresh dirt two or three times a year. If the ground is so wet or damp that this condition can not be corrected by filling, it is best to provide a board floor, as this will help to keep the house dry, will allow easier cleaning, and will promote the general health and welfare of the hens. A house with a board floor should be set on posts or blocks, so that it is 5 to 12 inches above the

ground. When this space is left the floor will not rot so quickly and rats are not so likely to take refuge under the house. (See fig. 8.)

**Dropping boards and roosts.**—To keep the flock in a clean and sanitary condition, dropping boards should be provided under the roosts. This makes it easy to remove the droppings each morning and helps greatly to keep the house free from objectionable odors. A little sand or ashes sprinkled on the dropping board after each cleaning will make the cleaning easier.

The dropping boards and roosts should be placed against the back wall. Here they are out of the way and also are least likely to be reached by drafts. The dropping boards should be about 20 to 30

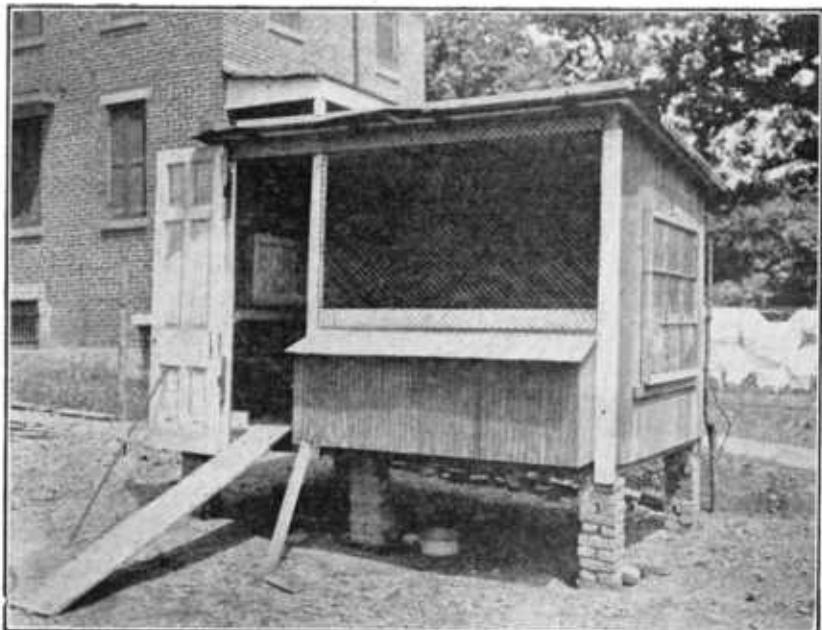


FIG. 8.—A good type of open-front poultry house for a small flock. The front can be closed with a muslin curtain on cold nights. The house is set on brick piers so as not to afford a refuge for rats. Notice the nests built out on the front of the house where the eggs can be reached by raising the hinged cover.

inches from the floor, depending on the height of the building. This gives space enough under them so that the hens have room to exercise and is not too high for the heavier hens to fly up to. The roosts should be 3 or 4 inches above the dropping boards. If more than a single roost is used, they should be on the same level; otherwise all the hens will try to crowd upon the highest roost. A piece of 2 by 4 or 2 by 3, laid on edge and with the upper corners rounded off, makes a good roost. A pole, or even a piece of board 2 or 3 inches wide, may be used. If the roost is of light material and fairly long,

it should be supported in the center, as well as at the ends, to prevent it from sagging badly. An allowance of 7 to 10 inches of roost space per fowl, according to the size of the birds, should be made. If more than one roost is used, they should be placed about 15 inches apart.

**Nests.**—Nests must be provided and may be very simple. Any box about 1 foot square and 5 or 6 inches deep is suitable. An ordinary orange box with the partition in the middle serves very well, each box forming two nests. The top is removed, the box laid on its side, and a strip 3 to 4 inches wide nailed across the lower front. (See

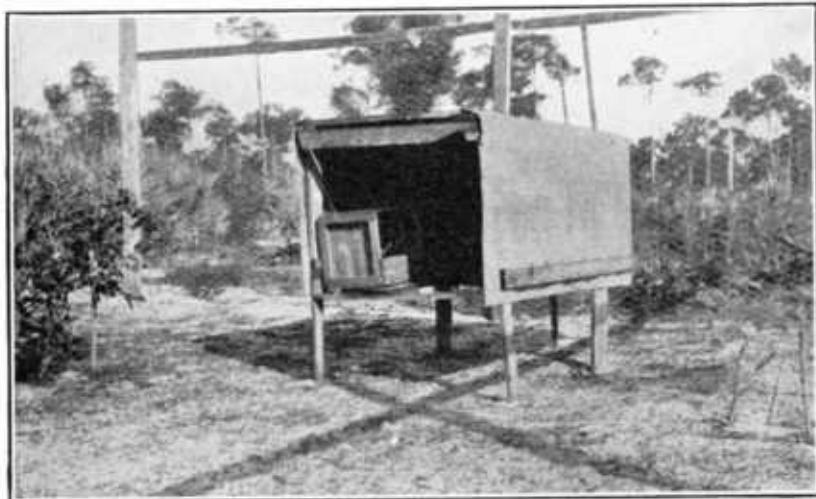


FIG. 9.—Shelter suitable for 4 or 5 hens, consisting of a lumber framework covered with roofing paper. This shelter has no floor and is provided only with roosts and nests. It is especially adopted for back yards in southern parts of the country.

fig. 11.) Nests can be fastened against the walls of the house or set on the floor. It is preferable to fasten them against the wall, as they take too much floor space if set on the floor. One nest should be provided for each 4 or 5 hens.

The straw or other material used in the nest should be kept clean and not be allowed to get so low that the eggs when laid by the hen will strike the board bottom of the nest, as this will cause them to break and will start the hens to eating the eggs, which is a very troublesome habit and one that is difficult to break up once it is formed.

**Litter.**—A litter of straw or the leaves raked up in the fall, about 3 or 4 inches deep, should be used on the floor of the house. This material helps to absorb the droppings and also provides a means of feeding the grain in such a way that the hens are obliged to exercise by scratching for it.

**Coops for broody hens.**—When hens become broody, they should be "broken up" as quickly as possible, for the sooner this is done the sooner they will resume laying. To break a hen of broodiness she should be confined to a small coop raised off the ground, preferably with a slat bottom. Give her plenty of water to drink; she may be fed or not, as desired. Not much difference will be found in the time required to break her of broodiness, whether she is fed or made to fast. Usually from 3 to 6 days' confinement will break her, but some hens require 10 to 12 days. The broody hen will be recognized by her inclination to stay on the nest at night, the ruffling of her feathers and her picking at any one who approaches her, and

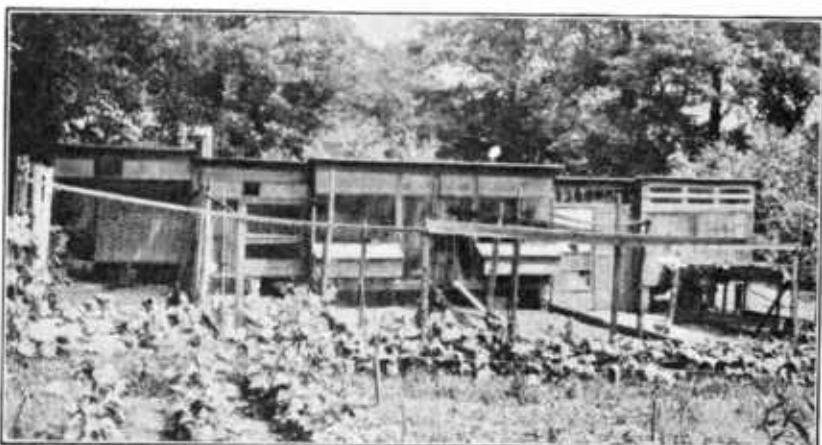


FIG. 10.—A larger poultry house suitable for a suburban lot. Notice the old lumber, sash, etc., used in the construction. The utilization of such used material, which can often be purchased for a small sum at auction or where buildings are being wrecked, lessens the cost of the poultry buildings very materially.

by the clucking noise she makes. The fact that her broodiness has been broken up can be recognized by the disappearance of these symptoms.

#### THE YARD.

The yard should be inclosed by a board or wire fence. Wire fencing is preferable, as it is cheaper and the hens are less likely to fly over it. If cats prove troublesome where young chickens are being raised, it may be necessary to cover the top of the yard with wire netting. A board should not be used at the top of a wire fence as this gives the hens a visible place to alight and tends to teach them to fly over. A 5-foot fence is high enough for most conditions, but if the hens show a tendency to fly over such a fence the flight feathers of one wing should be clipped.

The larger the yard which can be provided the better the hens will do, as it not only gives them greater opportunity to exercise, but also makes it possible to maintain a sod on the yard. In most cases not enough land will be available so that a sod can be maintained.

If the yard is fairly large, it can be divided into two parts and green crops, such as oats, wheat, rye, or dwarf essex rape, allowed to start in one yard while the hens are confined to the other. (See fig. 12.) The green crops should be sown very thick, and the following quantities will be found satisfactory for a yard 25 by 30 feet: Wheat,  $2\frac{1}{2}$  pounds; oats,  $1\frac{1}{2}$  pounds; rye,  $3\frac{1}{2}$  pounds; rape, 5 ounces. When the growing stuff reaches a height of 2 or 3 inches the hens can be turned upon it and the other yard be similarly sown.

Where it is inadvisable to divide the yard, it is possible to keep a supply of green stuff growing by using a wooden frame 2 or 3 inches high, covered with 1-inch-mesh wire. A frame made of 2 by 4 lumber, 6 feet long and 3 feet wide, with an additional piece across the center to support the wire when the hens stand on it, will be found desirable for a small yard. (See fig. 13.) A part of the yard as large as this frame is spaded up and sown, the frame placed over it, and the material allowed to grow. As soon as the green sprouts reach the wire the hens will begin to pick them off, but since they can not eat them down to the roots the sprouts will continue to grow and supply green material. This frame can be moved from place to place in the yard, and different parts cultivated.

The yard should be stirred or spaded up frequently if not in sod. This will not only tend to keep down any odors which might arise, but also allow the droppings to be absorbed into the soil more readily and therefore keep the yard in better condition for the hens.

Although it is necessary to keep the hens confined to their yard most of the time, it is sometimes possible to let them out where they may range upon the lawn for an hour or so in the evening when some one can be at hand to watch them, or at certain seasons of the year to allow them to run in the garden plot. This will be enjoyed greatly by the hens and will be very beneficial to them.

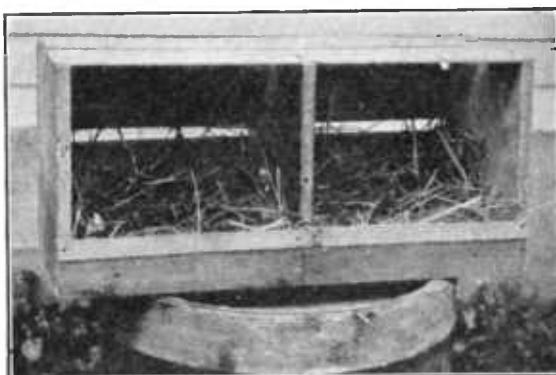


FIG. 11.—An orange box converted into a double nest by laying it on its side and nailing strips across the front to hold the nestling material in.

## FEEDING.

**Table scraps.**—The city flock should be fed as cheaply as possible, consistent with the production of eggs. All table scraps, kitchen waste, etc., should be utilized. Scraps of meat or left-over vegetables which can not be utilized in any other way make excellent feed. Many other waste products, such as beet tops, turnip tops, carrot tops, potato parings, onion tops, watermelon and cantaloupe rinds, the outside leaves of cabbages, waste lettuce leaves, bread and cake crumbs, etc., are relished by the hens and can be used to the best advantage. In saving the scraps and waste it is well to separate the portions adapted for feeding to the flock and place these in a receptacle or pail of their own. Decomposed waste material or moldy

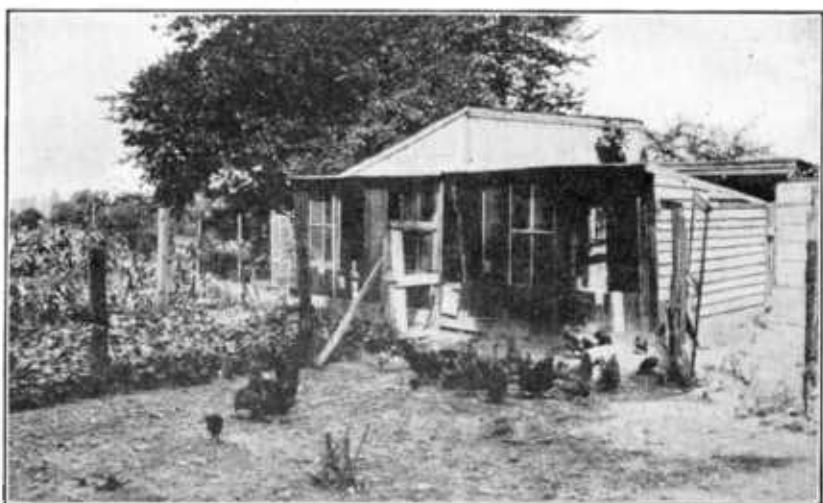


FIG. 12.—Back-yard poultry house and flock. Notice the double yard. The green crop of the first yard has been fed off and the second yard is planted to rape, which is about ready to feed. The mulberry tree in the background provides, when the berries are ripe, nearly enough feed for a flock of 25 hens for three weeks.

bread or cake should never be saved to feed to the hens, as it is harmful to them and may cause serious bowel trouble. Sloppy material, such as dishwater, should not be thrown into their pail. It is also useless to put in such things as banana peels or the skins of oranges, as these have little or no food value. Any sour milk which is not utilized in the house should be given to the chickens. This should be fed separately, however, either by allowing the hens to drink it or by allowing it to clabber on the back of the stove and then feeding it in that condition. When the family's table waste is not sufficient for feeding the flock, it is usually possible to get some of the neighbors who keep no hens to save material suitable for

feeding. Many people are glad to do this if a small pail in which to place the waste is furnished.

Table seraps and kitcheen waste are best prepared for feeding by running them through an ordinary household food chopper or meat grinder. After the material has been put through the grinder it is usually a rather moist mass, and it is well to mix with it some corn meal, bran, or other ground grain until the whole mass assumes a crumbly condition. The usual method is to feed the table seraps at noon or at night, or at both times, as may be desired, in a trough or on a board. All should be fed that the hens will eat up clean, and if any of the material is left after one-half or three-quarters of an hour it should be removed. If allowed to remain it may spoil and will be very bad for the hens.

**Grain.**—With the table seraps it is well to feed some grain. Perhaps this may be given best as a light feed in the morning. Four or five handfuls of grain (about  $\frac{1}{2}$  pint) scattered in the litter will be sufficient for a flock of 20 to 25 hens. By handful is meant as much as can be grasped in the hand, not what can be scooped up in the open hand.

By scattering it in the litter the hens will be compelled to scratch in order to find the grain and in this way to take exercise, which is decidedly beneficial to them. In case not enough good, sound, substantial table seraps are available to furnish full feeds, both at noon and at night, another feed of the grain mixture should be thrown into the litter at the night feed and should consist of as much as the hens will eat up clean. In summer or during suitable weather the grain can be fed by scattering it on the ground outside the house. A good grain mixture for this purpose is composed of equal parts by weight of wheat, cracked corn, and oats. Another suitable grain mixture is composed of 2 parts by weight of cracked corn and 1 part oats.

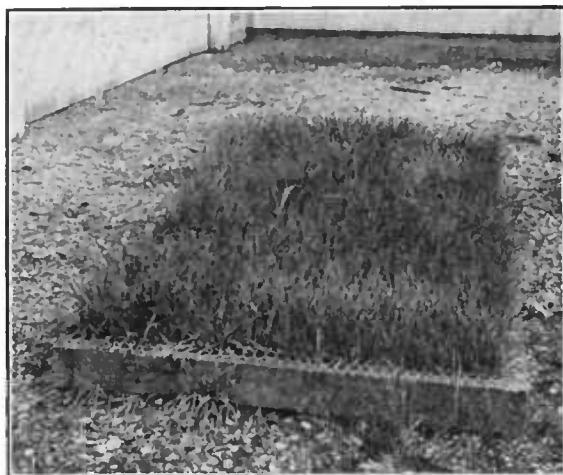


FIG. 13.—A frame made of 2 by 4 inch lumber and covered with  $\frac{1}{2}$ -inch-mesh poultry wire used to sprout oats or other grain for the hens. The wire prevents the hens from eating the sprouts down so close as to kill the plants and from scratching out the roots. Grain which is sprouted without protection will be quickly killed.

**Dry mash.**—In addition to the grain and the table scraps it is well to feed a dry mash. This dry mash is composed of various ground grains and is placed in a mash hopper or box from which the hens can help themselves. The advantage of feeding such a mash is that the hens always have access to feed, and this tends to make up for any faulty, inexperienced, or insufficient feeding. The hens do not like the dry mash so well that they are likely to overeat, but it will supply a source of feed in case they are not getting enough. The

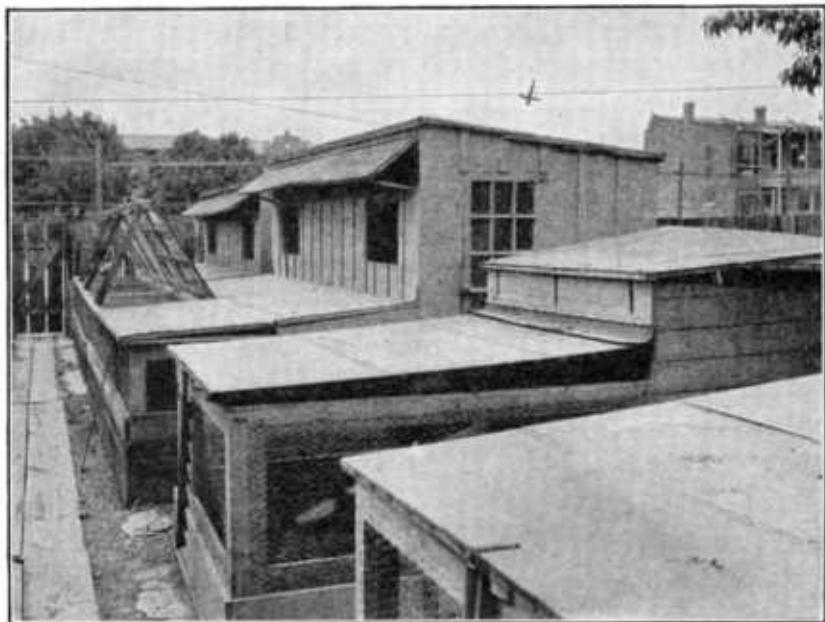


FIG. 14.—An intensive back-yard poultry plant. Practically the entire back yard is occupied by houses and covered runs, and about 70 hens are carried. In addition, chickens are raised here. Each house is 6 by 14 feet, divided into two pens with a covered yard of the same size. Each pen carries about 15 hens. The houses are raised from the ground so that the hens can run under them. The soil in the runs is renewed four times a year. A flock of 13 hens in one of these pens laid 2,163 eggs in a year. Oats are sprouted in the cellar of the dwelling house for green feed.

dry mash also provides a suitable medium for feeding beef scrap, a certain amount of which may or may not be necessary, depending upon the amount of meat scraps available in the table waste. If the hens show a tendency to become overfat it may be desirable to close the mash hopper during a part of the day and allow them access to it only during a certain period, preferably the afternoon. A good dry mash is composed of equal parts by weight of corn meal, wheat bran, wheat middlings, and beef scrap. Another good mash is composed of 3 parts by weight of corn meal and 1 part beef scrap. Still a third mash, which has given excellent results, is composed of 1

pound of wheat bran, 1 pound of wheat middlings, 6.5 pounds of beef scrap, and 16.5 pounds of corn meal. The beef scrap used in the dry mash is usually the most expensive ingredient, but it is an essential part of the mash and very efficient for egg production. It should not be eliminated or reduced unless the quantity of meat in the table scraps is considerable or unless some other product can be substituted for it. Fish scrap, when available, may replace the beef scrap, or cottonseed meal can be used to replace one-half the beef scrap in the mash. No attempt should be made to replace more than half the beef scrap with cottonseed meal, as the results in egg production and in the quality of the eggs will be unsatisfactory.

**Bone.**—Green-cut bone can often be purchased from the butcher. This material when procured fresh makes an excellent substitute for beef scrap. It should be purchased in small quantities, as it can not be kept fresh for any length of time and when spoiled may cause severe bowel trouble. It is best fed in a trough not oftener than every other day, allowing about one-half ounce per bird. Should severe or continued looseness of the bowels follow the feeding of green-cut bone it should be discontinued or the quantity reduced.

**Green feed.**—Vegetable tops, parings, and other vegetable refuse supply a valuable and very necessary green feed for the hens. Lawn clippings also are a valuable green feed. They can be fed as soon as cut, or they may be dried or cured, stored in bags, and saved until winter, when they can be soaked in warm water and fed in that condition or be mixed with some of the mash or with the table scraps.

**Grit.**—The hens should have access at all times to a supply of grit or stones of a size small enough to be swallowed readily. Grit is used by the hens to help in grinding in their gizzards the hard



FIG. 15.—Inclosure for hen and chicks with box used as a coop at the end. Both coop and run is moved each day to fresh spot of ground. A burlap bag thrown across the top of the yard provides shade. Twenty-five chicks were put with a hen in this yard and 24 of them were raised, making good growth.

grains which they eat. A supply of ordinary gravel will answer the purpose of grit very well. Crushed oyster or clam shell also should be given to the hens and be kept before them at all times. If this is withheld the hens are likely to lack sufficient shell-forming material in their feed, with the result that they lay many soft-shelled or thin-shelled eggs. Grit or shell can be purchased in small quantities at any feed or poultry-supply store.

**Water.**—A plentiful supply of clean, fresh water must always be available to the hens. The fowls drink freely, especially when laying heavily, and should not be stinted in the supply. The water pan or dish should be kept clean. If it is not washed out frequently a green slime will gather on its inner surface. It is well to keep the water pan outside the house and in the shade in the summer, but in freezing weather it is best to keep the pan in the house and empty it each night. It should be raised about a foot above the floor so that the hens will not scratch litter into it.

#### LICE AND MITES.<sup>1</sup>

**Dust bath.**—If the best results are to be expected from the flock, the hens must not be allowed to become overrun with lice or the house with mites. Usually there will be a place in the yard where the hens can dust themselves in the dry dirt. In the absence of such a place, a box about 2 feet square and containing ordinary road dust or fine dirt should be placed in the house. A dust bath aids the hens in keeping lice in check and therefore adds to their comfort. If they are not able to keep them in check by dusting themselves, other measures can be taken.

**Lice.**—To rid the hens of lice, each one can be treated by placing small pinches of sodium fluorid, a material which can be obtained at most large drug stores, among the feathers next to the skin—one pinch on the head, one on the neck, two on the back, one on the breast, one below the vent, one at the base of the tail, one on each thigh, and one scattered on the underside of each wing when spread. Another method is to use a small quantity of blue ointment, a piece about as large as a pea on the skin 1 inch below the vent. If mercurial ointment is used instead of blue ointment, it should be diluted with one-half the quantity of vaseline or lard. Any of these methods will be found very effective in ridding the hens of lice and should be employed whenever the lice become troublesome. Two or three applications a year usually prove sufficient.

<sup>1</sup> For further information on the subject of poultry lice and mites and their control the reader is referred to Farmers' Bulletin 801, "Mites and Lice on Poultry," by F. C. Bishopp and H. P. Wood, of the Bureau of Entomology. Copies of this bulletin may be obtained free on application to the Division of Publications, United States Department of Agriculture.

**Mites.**—Mites are more troublesome and more harmful than lice. They do not live upon the birds like the lice, but during the day hide in the cracks and crevices of the roosts and walls of the house, and at night they come out and get upon the fowls. They suck the hen's blood, and if allowed to become plentiful—as they certainly will if not destroyed—will seriously affect her health and consequently her ability to lay eggs. They may be eradicated by a few thorough applications of kerosene or some of the coal-tar products which are sold for this purpose, or crude petroleum, to the interior of the poultry house. The commercial coal-tar products are more expensive but retain their killing power longer, and the cost of treatment may be lessened by reducing with an equal part of kerosene. Crude petroleum will spray better if thinned with 1 part of kerosene to 4 parts of the crude oil. Both the crude petroleum and the coal-tar products often contain foreign particles, so should be strained before attempting to spray. One must be sure that the spray reaches all the cracks and crevices, giving especial attention to the roosts, dropping boards, and nests, and the treatment should be repeated two or three times at intervals of a week or 10 days.

### HATCHING AND RAISING CHICKS.

Sometimes it is advisable to attempt to renew the city poultry flock by hatching and rearing chicks or buying and rearing day-old chicks. Previous experience in the raising of chickens increases the chances of success. However, the land available is usually small in area, and no attempt should be made to raise chicks unless a plot can be provided separate from that to which the hens have access and upon which there is grass, or unless a supply of green feed can be furnished. Where these conditions are not available, it is better to kill the hens as soon as they have outlived their usefulness and replace them by well-matured pullets in the fall. Where it is found desirable to hatch and rear a few chicks this can best be done with hens. Where a few day-old chicks are purchased to rear and no hens are available for the purpose, it is possible with little trouble and expense to construct a fireless brooder which will answer the purpose. Full directions for making such a brooder are given in Farmers' Bulletin 624, page 10.<sup>1</sup>

The hatching should be done early in the spring and should be completed if possible by the first of May. Chicks hatched before this time will have a good chance to mature and be in laying condition as pullets before the cold weather of fall sets in, and should in consequence be producers during the entire fall and winter. Early hatched chicks are also easier to raise, as they live and thrive better than those which are still small when the hot weather begins. Per-

<sup>1</sup> Copies of this publication may be obtained free from the Division of Publications, U. S. Department of Agriculture.

sons desiring to hatch and raise chicks are referred to Farmers' Bulletins 585, "Natural and Artificial Incubation of Hens' Eggs," and 624, "Natural and Artificial Brooding of Chickens."<sup>1</sup>

### CULLING THE HENS.

In any flock some hens will be found to be much better producers than others. Often there are a few hens which are such poor producers that they are unprofitable. Where the flock is comparatively small, the owner is often able to determine by observation which hens are the poor layers; these should be the ones to eat.

All hens molt in the fall or early winter. During this molting season, which usually takes about three months, the hens lay few or no eggs. It is advisable, if well-matured pullets can be purchased at a reasonable price, to kill and eat the hens as they begin to molt, replacing them with pullets. The hens should not be killed, however, until they begin to molt and their combs begin to lose size, color, and flexibility, for if these changes have not taken place the hens will probably still be laying when eggs are especially valuable.

Detailed directions how to cull out the hens which are not laying are given in Department Circular 31, "Culling the Poultry Flock."

### PRESERVING EGGS.

A small flock of hens, even five or six, may produce eggs enough during the greater part of the year to supply the needs of a medium-sized family. Where a larger flock is kept, there will be a time during the spring and early summer when more eggs are produced than are used. These surplus eggs can either be sold or, what is perhaps more desirable, preserved in the spring for home use during the fall and early winter, when eggs are high in price and much more difficult to obtain from the flock.

The eggs to be preserved must be fresh. They should be put into the preserver on the day on which they are laid. The eggs should be clean, but it is better not to wash them. Eggs with dirty shells can be used for immediate consumption and the clean eggs preserved. Cracked eggs or those with thin or weak shells should never be used for preservation. Not only will the cracked egg itself spoil, but it will cause many of the other eggs packed in the same jar with it to spoil as well.

**Water glass.**—One of the best methods of preserving eggs is by the use of water glass. This material can be purchased by the quart from the druggist or poultry-supply men. It is a pale yellow, odorless, sirupy liquid. It should be diluted in the proportion of 1 part

<sup>1</sup> Copies of these publications may be obtained free from the Division of Publications, U. S. Department of Agriculture.

of water glass to 9 parts of water which has been boiled and allowed to cool. Earthenware crocks or jars are the best containers for the purpose, since they have a glazed surface and are not subject to chemical action from the solution. The crocks or cans should be scalded out, so that they will be perfectly clean, and allowed to cool before they are used. A 6-gallon container will accommodate 18 dozen eggs and will require about 22 pints of solution. Too large containers are not desirable, since they increase the liability of breaking some of the eggs. Half fill the container with the water-glass solution and place the eggs in it. Eggs may be added from day to day as they are obtained, until the container is filled. Be sure that the eggs are covered with about 2 inches of water-glass solution. Cover the container and place it in a cool place, where it will not have to be moved. It should be looked at from time to time to see that not enough of the water has evaporated so that the eggs are too near the surface. If there seems to be any danger of this, sufficient cool boiled water should be added to keep them covered.

Remove the eggs from the solution as desired for use and rinse them in clean, cold water. Before boiling such eggs prick a tiny hole in the large end of the shell with a needle, to keep them from cracking. As the eggs age the white becomes thinner and is harder to beat. The yolk membrane becomes more delicate, and it is correspondingly difficult to separate the whites from the yolks.

**Limewater.**—Limewater is also satisfactory for preserving eggs and is less expensive than water glass. A solution is made by placing 2 or 3 pounds of unslaked lime in 5 gallons of water which has been boiled and allowed to cool, and allowing the mixture to stand until the lime settles and the liquid is clear. The eggs should be placed in a clean earthenware jar or other suitable vessel and covered to a depth of 2 inches with the liquid. Remove the eggs as desired, rinse in clean, cold water, and use immediately.

## PRACTICAL POINTERS.

Keep the hens confined to your own land.

Don't keep a male bird. Hens lay just as well without a male.

Don't overstock your land.

Purchase well-matured pullets rather than hens.

Don't expect great success in hatching and raising chicks unless you have had some experience and have a grass plot separate from the yard for the hens.

Build a cheap house or shelter.

Make the house dry and free from drafts, but allow for ventilation.

Fowls stand cold better than dampness.

Keep house and yard clean.

Provide roosts and dropping boards.

Provide a nest for each four or five hens.

Grow some green crop in the yard.

Spade up the yard frequently.

Feed table scraps and kitchen waste.

Also feed grain once or twice a day.

Feed a dry mash.

Keep hens free from lice and the house free from mites.

Kill and eat the hens in the fall as they begin to molt and cease to lay.

Preserve the surplus eggs produced during the spring and summer for use during the fall and winter when eggs are scarce and high in price.